Advances in Agriculture, Sciences and Engineering Research
http://www.ejournal.sedinst.com
© Science Education Development Institute, 2012 Volume 2 (11) Dec.: 526 - 532, 2012
Printed in Nigeria ISSN: 2276 - 6723

ECTOPARASITES OF FARMED *Clarias gariepinus* IN ETI-OSA LOCAL GOVERNMENT AREA, LAGOS STATE, NIGERIA.

Elezuo K. O[1], Omonona A.O[2] and Adedokun A.O[3]
[1]Department of Fisheries Technology, Federal College of Fisheries and Marine Technology, P.M.B 80063, Victoria Island, Lagos, [2]Department of Wildlife and Fisheries Management, University of Ibadan, Ibadan, Nigeria and [3]Department of Veterinary medicine, University of Ibadan, Ibadan, Nigeria

ABSTRACT
The occurrence and prevalence of ectoparasites on farmed *Clarias gariepinus* from Eti-Osa local government area, Lagos State was investigated. A total of 110 fish specimens were procured from 5 farms in Eti-Osa local government area and examined for ectoparasite infestation. 5 out of the 110 fish specimens were infested giving a low prevalence rate of 4.5%. Two parasites namely Sanguinicola (blood fluke; *Digenean trematode*) and Nematode were isolated. There was no significant difference ($P>0.05$) between ectoparasite infestation in the male and female fish. There was no correlation between size of fish and ectoparasite infestation. Nematode had a higher prevalence, abundance and means intensity of 2.73%, 0.03 and 0.6 respectively than Sanguinicola with the values 1.82%, 0.02 and 0.4 for prevalence, abundance and means intensity respectively. All the ectoparasites were recovered from the gills, giving a prevalence rate of 4.5%. The low occurrence and prevalence of ectoparasites on farmed *C. gariepinus* from Eti-Osa local government area could be attributed to the high level of management observed in these farms. The high standard of pond and farm management attained by fish farmers in this local government area should be sustained. Also, the introduction of catfish fingerlings from the wild into the fish farms should be avoided.

KEYWORDS: Ectoparasites, Eti-Osa, Sanguinicola, Occurrence, prevalence,

INTRODUCTION

Fish contributes over 40% of total dietary protein consumption of Nigerians and is a staple source of protein of the average Nigerian diet (Dada, 2003). Fish is important in the development of Nigeria both economically as a source of income and health-wise as a source of first class protein with low cholesterol level in the diets of the populace (Aken' ova, 2000). By virtue of their economic importance to the populace, especially with the rapidly increasing population and consequent increase in protein demand, information on the parasites of fish becomes particularly important as these parasites may affect fish (Kudoro,1995; Aken' ova 2000). Parasites are organisms which spend part of their lives living on or at the expense of another (Lasce, 1995). Fish parasitic disease outbreak increase production cost due to the cost of treatment, the investment loss in dead fish and decreased growth of fish during and even after disease outbreak (Meyer 1984; Roberts 2001).

The African catfish, *Clarias gariepinus* (BURCHELL 1822) is generally considered to be one of the most important tropical fish species for culture in West Africa (Clay 1979; Hassan *et al.*, 2007). This catfish is widely distributed throughout Africa, inhabiting tropical swamps, lakes and rivers, some of which are subject to seasonal drying (Olufemi *et al.*, 1991). Commercial production of catfish is a rapidly growing industry. Concurrent with this growth is an increased interest in their parasites (Meyer, 1984; Roberts, 2001). There exists a relative susceptibility of different fish species to infection (Lasce 1995; Roberts 2001). While all types of fish harbor parasites, they are

found in some, more frequently than in others depending sometimes upon the age of the fish, the size of the fish (Lasce, 1995) and their stocking density in ponds.

Knowledge of parasitic diseases in Africa is predominantly made up of taxonomic studies. Paperna (1980) observed that most of such information consists of taxonomic studies and taxonomic descriptions of individual parasitic species from occasional collections from museum materials. Literature on the ectoparasite of *C. gariepinus* in Nigeria is scarce and ectoparasites reduce the growth of fish and also its market value because of the visible signs associated with them (Lasce, 1995). The aim of this study is therefore to determine the occurrence and prevalence of ectoparasites in *Clarias gariepinus* from fish farms in Eti-Osa local government Area of Lagos State, Nigeria.

MATERIALS AND METHODS

Area of Study

The Area of study is Eti-Osa Local Government Area. It is a water locked area comprising of Victoria Island, Ikoyi, Obalende, Lekki Penninsula, Sangotedo and Ajah areas of Lagos. It is a wetland area bounded on the north by Lagos lagoon, on the west by Apapa and Lagos Island, on the east by Ibeju- Lekki local government area and on the south by the Atlantic Ocean. It is an area characterized by artisanal fishing and fish farming activities. The strategic positioning of this area in terms of commerce, industry and tourism, the large expanse of Lagos lagoon and the Atlantic ocean surrounding the area probably led to the citing of Nigerian Institute for Oceanography and Marine Research (NIOMR), Federal College of Fisheries and Marine Technology (FCFMT), Federal Department of Fisheries (FDF) and National Conservation Foundation (NCF) in this local government area.

Sample Collection

A total of 110 live fish were procured from 5 fish farms in Eti-Osa local government Area namely: NIOMR water re-circulatory system (NIOMR WRC), Victoria Island, Akinsateru farms limited, Ikota, FCFMT fish farm, Victoria Island, Daileto Investment limited, Badore and Abcov farm, Jakande estate, Ilasan. 22 fish specimens were randomly collected from each farm between February and April 2008. The samples were transported live to the laboratory for analysis in each case. Water samples were collected from each of the farms' ponds and analyzed for their physico-chemical parameters using U-22 XD Horiba Multi-parameter water quality monitoring system.

Fish Examination

The length measurement of the fish specimens were taken prior to examination. The fish were sexed macroscopically. The fins and entire outer body surface of each specimen was examined according to the method described by Lasce (1995) and Roberts (2001). Smears made from scraping of the fins and body surface were mounted on a light microscope and examined under x10 and x40 power magnifications. The operculum of each specimen was opened; the gills were removed and examined using the method described by Lasce (1995) and Roberts (2001). The parasites recovered were stained with Lugol's iodine, fixed in 70% alcohol and mounted with Canada balsam (Lasce, 1995; Akinsanya *et al.*, 2007.) They were identified based on external morphology and counted.

Data Analysis

The prevalence of ectoparasite infection was estimated using the model:

$$\text{Prevalence (\%)} = \frac{\text{No. of fish host infested}}{\text{Total no. of fish host examined.}} \times 100$$

(Akinsanya *et al.*, 2007; Hassan *et al.*, 2007).

The Abundance and mean intensity of ectoparasite were estimated using the following models:

$$\text{Abundance} = \frac{\text{Total no. of individuals of a particular parasite sp. in a sample of fish examined}}{\text{Total no. of fish host examined.}}$$

$$\text{Mean intensity} = \frac{\text{Total no. of individuals of a particular parasite sp. in a sample of fish examined}}{\text{No. of fish host infested.}}$$

(Oluseye, 1990).

Statistical analyses of data obtained were carried out using analysis of variance, correlation and chi-square.

RESULTS

Occurrence, Prevalence, abundance and mean intensity of ectoparasites recovered from farmed *C. gariepinus*.

Five out of the 110 fish examined had ectoparasites giving a low prevalence rate of 4.55% for farmed *C. gariepinus* from Eti-Osa local government area.

Two types of parasites were recovered namely Nematode and Sanguinicola (blood fluke; digenean trematode). Table 8 shows the prevalence, abundance and mean intensity of ectoparasites recovered from farmed *C. gariepinus* in Eti-Osa local government area. Nematode had a higher prevalence rate (2.73%), abundance (0.03) and mean intensity (0.4) than Sanguinicola with prevalence rate of 1.82%, abundance 0.02 and mean intensity of 1.82.

Table 1: Prevalence, abundance and mean intensity of ectoparasites recovered from farmed *C. gariepinus*.

Parasite	Total no. recovered	No. of fish infested	Abundance	Mean intensity	Prevalence (%)
Nematoda	3	3	0.03	0.6	2.73
Sanguinicola	2	2	0.02	0.4	1.82

Sex- Parasite infestation on farmed *C. gariepinus*
Table 2 shows the infestation of ectoparasites according to sex of fish. 2 out of 54 males and 3 out of 56 females were infested.

Table 2: Infestation of ectoparasites on farmed *C. gariepinus* according to sex of fish.

Fish sex	Total no. examined	Number of fish host infested	Prevalence (%)
Male	54	2	3.7
Female	56	3	5.36
Total	110	5	

There was no correlation ($p>0.05$) between sex and parasite infestation. Prevalence of ectoparasites in females (5.36%) was slightly higher than in males (3.7%) but there was no significant difference ($p>0.05$) between the two.

Length-ectoparasite infestation on farmed *C.gariepinus*
Table 3 shows the length-parasite infestation for farmed *C.gariepinus* from Eti-Osa local government area. The length class 36.00-42.99 cm had the highest prevalence rate of 13.33%, followed by the length class 29.00-35.99 cm (6.25%). The other length classes had no ectoparasite.

Table 3: Length –parasite infestation of farmed *C. gariepinus* from Eti-Osa local government area.

Length class (cm)	No. of fish host examined	No. of fish host infested	Prevalence (%)
15.00-21.99	4	0	0.0
22.00-28.99	41	0	0.0
29.00-35.99	48	3	6.25
36.00-42.99	15	2	13.33
43.00-49.99	02	0	0.00
Total	110	5	

There was no correlation ($P>0.05$) between length of fish and ectoparasite infestation.

Ectoparasite infestation on farmed *C. gariepinus* according to location of the body paracitized.

Table 4 shows the infestation of ectoparasites on farmed *C. gariepinus* according to location of the body infested. Parasites were recovered from the gills only with a prevalence rate of 4.5%. The body surface and fins had no ectoparasites on them.

Table 4: Infestation of ectoparasites on *C.gariepinus* based on location of the body paracitized.

Location of the body paracitized	Frequency of occurrence of parasite	Prevalence (%)
Body surface	0	0.0
Gill	5	4.5
Fins	0	0.0

WATER QUALITY

Table 5 shows the result of water quality analysis for the five fish farms sampled in Eti-Osa local government area.

Table 5: Water Quality Parameters of the sampled farms in Eti-Osa local government area (Februay-April, 2008).

Parameters	Sampling sites A	D	N	F	C
Temperature (°C)	29.7± 0.43	32.3± 0.2	29.15± 0.07	29.2± 0.14	30.8± 0.95
Dissolved Oxygen (g/l)	6.1± 0.1	4.4± 0.1	7.0± 0.7	7.4± 0.14	5.0±0.2
pH	7.8± 0.36	6.7± 0.17	6.3± 0.14	6.3± 0.1	7.0± 0.1
Salinity (%)	0.2± 0.1	0.1± 0.0	0.0± 0.0	0.0± 0.0	0.1± 0.0
Nitrite (mg/1)	0.1± 0.05	0.5± 0.05	0.28± 0.3	0.15± 0.07	0.3± 0.1
Ammonia (mg/1)	0.5± 0.17	0.5± 0.0	07.5± 3.5	0.5± 0.07	5.0± 0.1
Water Hardness (ppm)	80± 5.0	50± 2.0	70± 0.0	72± 3.5	100± 5.0

Legend:

A = Akinsateru farms limited. D = Deilato Investment, N = NIOMR water re-circulatory system, F = FCFMT fish farm, C = Abcov farm

Advances in Agriculture, Sciences and Engineering Research: Volume 2 (11) Dec.: 526 - 532, 2012

DISCCUSSION, CONCLUSION AND RECOMMENDATIONS

The parasite fauna of fish is determined qualitatively and quantitatively by the complex interactions between abiotic and biotic factors (Jegede, 1989). From this study, 5 *C. gariepinus* out of 110 examined were parasitized. This gave a low prevalence rate of 4.55%. This is in consonance with that of Hassan *et al.*, (2007) who worked on haemoparasites of *Clarias gariepinus* from lekki lagoon and reported low prevalence rate of 7.2%. Two parasites were found to be parasitizing *C. gariepinus* from this study namely Nematoda and Sanguinicola (digenean trematode). Farmed *C. gariepinus* from this study had low nematode prevalence of 2.73% (Table 3).This is consistent with that of Elezuo *et al.*, (2012) who reported nematode infestation on wild *C. gariepinus* from Lagos lagoon at a low prevalence rate of 2.73%. It is also consistent with the report of Oluseye (1990) who worked with *C. gariepinus* at the fish breeding centre of the Ministry of Agriculture, Ibadan and reported Nematode infestation at a low prevalence rate of 7.4%. Kudoro (1995) worked on some parasites of cultured fishes at Mobolaji fish farm, Ado-odo, Ogun state and reported the prevalence rate of nematode on *C. gariepinus* at 14.81%. Adikwu and Ibrahim (2004) recorded nematode infestation of *C. gariepinus*' intestine at a prevalence rate of 40.82%. Nematodes are common gut parasites of fish, thus its occurrence on the gills from this study could be due to migration of the nematodes from the gut to the gills, gut content contamination of the gills or entrance of the nematodes with water from the body surface (Oluseye, 1990) into the opercula chamber.

Sanguinicola (blood fluke; digenean trematode) was recovered from the gills of farmed *C. gariepinus* at a prevalence rate of 1.82%. This was similar to the value (0.91%) reported by Elezuo *et al*., (2012) for the wild stock. Lasce (1995) reported that the blood fluke Sanguinicola live as adult in the gill arterioles of salmonids and other fishes. The same author reported that in some cases, blood flukes do not cause serious losses of fish; but if large numbers of miracidia leave the gills at a time, it can cause extensive gill damage. Eggs and developing miracidia also interfere with the circulation of blood in the capillaries of the gills, kidney and liver (Lasce, 1995). Adeyemo (2001) investigated the incidence and pathogenesis of *Clinostomum tilapiae*, a trematode parasite of tilapia and reported the prevalence of this parasite to range between 25.95-88.89% with mean abundance of 1.73 ± 1.22 and mean intensity of 3.14± 1.5 among fish farms in Oyo State. This abundance and mean intensity are similar to those obtained from this study with abundance and mean intensity of Sanguinicola at 0.02 and 0.4 respectively. Adekunle (1989) worked on trematode parasite found in various organs in tilapia collected from Fisheries Department fish farm, University of Ibadan and observed the occurrence of the digenean trematode *Clinostomum marginatum* on the skin of tilapia. From the present study, although female *C. gariepinus* were more parasitized (prevalence= 5.36) than their male counterpart (prevalence= 3.7), there was no significant difference between the two. Elezuo *et al*., (2012) reported that female *C. gariepinus* from Lagos lagoon were more parasitized than males having percentage infestation of 52.63% and 47.37% respectively. Kudoro (1995) also reported that female *C. gariepinus* were more paracitized than the males having percentage infestation of 52.63% and 47.37% respectively. The insignificant difference in prevalence of infection in male and female *C. gariepinus* from this study could be attributed to the generally low incidence of ectoparasites. There was no correlation (P>0.05) between length of fish and parasite infestation for farmed *C. gariepinus*. This could also be attributed to the generally very low incidence of ectoparasite for the farmed stock.

From this study, all the parasites were recovered from the gills. This gave a prevalence of 0.0% and 4.5% for the body surface and gills respectively. The absence of ectoparasites on the body surface could be attributed to the fact that *C. gariepinus* lacks scales and as such offers less hiding and attachment sites for ectoparasites on their body surface.

The result of the water quality analysis shows that the physico-chemical water quality parameters of the sampled farms (Table 6) were within or at least not far from the recommended range for catfish. This probably explains why *C. gariepinus* from these farms were generally free from ectoparasite infestation.

The very low occurrence and prevalence of ectoparasites on cultured *C. gariepinus* from Eti-Osa local government area could be attributed to the high level of management observed in farms in this local government area. It is interesting to note that Lagos is a very competitive business environment and those in commercial fish farming must adopt the best aquaculture practices in order to break even. Also, Eti-Osa local government area enjoys the advantage of hosting most of the important Fisheries establishments namely NIOMR, FCFMT and FDF that give the fish farmers technical assistance for optimum production.

The high standard of management and aquaculture practice attained by fish farms in this local government area should therefore be sustained. The introduction of catfish fingerlings from the wild to fish farms should be discouraged to avoid the transfer of parasites from the wild to farms.

REFERENCES

Aken'ova, T. (2000). Copepod parasites of the gills of *Clarias species* in two lakes and a river in Zaria, Nigeria. *The Nigeria Journal of Parasitology*. Vol. 20. Pp. 113-121.

Adeyemo, A.O. (2001). Incidence and Pathogenesis of *Clinostomum tilapiae*. A trematode parasite of Tilapia (*Oreochromis niloticus*). Ph D. Thesis, University of Ibadan. 224 pp

Adikwu, I. A. and Ibrahim, B. A. (2004). Studies on the endoparasites in the gastro-intestinal tract of *Clarias gariepinus* (Tugels) in Wase dam, Kano State, Nigeria. http://www.uniportjournal.com/ajazeb 2004/articles/4.htm.

Akinsanya, B., Otubanjo, O. A. and Hassan, A. A. (2007). Helminth Parasites of *Malapterurus electricus* (Malapteruridae) from Lekki lagoon, Lagos, Nigeria. *Journal of American Science* 3 (3): 1-5